

NEWSLINE

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Signing sets course for collaboration



JACQUELINE MCBRIDE/NEWSLINE

From left: U.S. Navy Rear Adm. Patrick Dunne looks on as Laboratory Director Michael Anastasio signs a memorandum of understanding establishing a framework for scientific and technical collaboration in the area of national security. See story, page 7.

JGI and Stanford announce completion of sequencing for gene-rich Chromosome 19

By David Gilbert

NEWSLINE STAFF WRITER

The Joint Genome Institute (JGI) and Stanford University reported Thursday the completion of the sequencing of human Chromosome 19, the most gene-rich of all the human chromosomes. This achievement is described in the April 1 edition of the journal *Nature*.

“Culminating 18 years of research, this partnership exemplifies DOE’s commitment to advancing our understanding of the complex interplay between our human health and the environment,” said Energy Secretary Spencer Abraham, whose agency funded the work through its Office of Science.

Embedded in this sequence information are critical regulatory networks of genes tasked with controlling such functions as repairing DNA damage caused by exposure to radiation

See **CHROMOSOME**, page 8

Professorship to link NIF and UCLA plasma physics group

By Charles Osolin

NEWSLINE STAFF WRITER

UCLA and the National Ignition Facility (NIF) at the Laboratory will be the first beneficiaries of a stepped-up effort by the University of California to tap into the scientific expertise and facilities of the national laboratories managed by the University.

A search is under way to fill a UCLA/NIF joint professorship, a tenure-track appointment at the assistant professor level that will reside in UCLA’s electrical engineering and physics departments.

The UCLA/NIF professorship will create a “natural avenue” for UCLA faculty and students to pursue research in high energy-density plasma physics, inertial confinement fusion and

astrophysics at the world’s most powerful laser facility, according to Roberto Peccei, UCLA’s vice chancellor for research.

“For many years we have had a strong plasma group at UCLA working on laser-plasma interactions,” Peccei said. “This professorship will ensure that we will be able to increase this

See **COLLABORATION**, page 7

Surplus plutonium oxide canned, ready for shipment

By David Schwoegler

NEWSLINE STAFF WRITER

The Laboratory has completed stabilizing and packaging its surplus plutonium oxide. The activity was based upon Defense Nuclear Facilities Safety Board Recommendation 94-1, advising that Department of Energy sites stabilize plutonium — especially residues — for long-term storage of up to 50 years.

Shortly after the board made this recommendation, the DOE complex and its contractor sites started stabilizing surplus plutonium and storing it

See **PU**, page 8

National Academies panel to visit Laboratory

A study committee from the National Research Council (NRC) of the National Academies will hold a meeting Monday, April 5, with Laboratory managers and scientists, and an afternoon public session to gather information relevant to the upcoming contract competitions for both Lawrence Livermore and Los Alamos national laboratories.

The academy was asked by the National Nuclear Security Administration (NNSA) to provide advice about the science and technology aspects of the competition. The meeting will be held on the UC Davis Department of Applied Science campus, beginning at 10 a.m.

“Our charge from the National Nuclear Security Administration is to advise the NNSA on the development of criteria for evaluating the capabilities of bidders for the LANL and LLNL management contracts for managing science and technology at the labs. The goal of the NNSA is to ensure the continuation of world-class science and technology at both LANL and LLNL,” said Richard Rowberg, associate executive director of the

National Academies’ Division on Engineering and Physical Sciences.

The opening overview, slated for 10 a.m. to noon, is open to the public. In addition, the general public will be able to address the committee from 3:30 to 5:30 p.m.

“Speakers at the public meeting should give their views on the important characteristics in a LLNL contract manager that concern the management of science and technology at the Lab,” Rowberg said.

Anyone wishing to attend either the opening session or the public meeting to provide comment should pre-register with the Laboratory’s Community Relations Office by calling 3-3125. Members of the public will be given three minutes each for comment, and will be pre-registered on a first come, first-served basis. If time permits, people wishing to speak may also sign up at the door at the public session. Those wishing to provide comment will also be asked to present a written synopsis of their comments for the record.



Do-it-yourself supercomputing

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All’s fair in science competition

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UC town hall contract talks

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LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Saturday
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There will be a **scheduled power outage** today from 7 a.m. to 3 p.m. in Bldg. 423. Air conditioning, heating and elevators also will be affected. For further information, contact Mark Cardoza, 3-0490.

Sunday
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The Sunol 4-H is hosting the **38th Annual Pancake Breakfast** today from 8 a.m. to noon at Sunol Glen School. Breakfast includes scrambled eggs, sausage, pancakes, juice, milk and coffee. There also will be a bake sale, plant sale and silent auction. Tickets are \$5 for adults, \$4 for children and are available at the door or from any Sunol 4-H member. For tickets or further information, call (510) 676-5377.

Monday
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The Lab's quarterly **blood drive** begins today and runs through Thursday in Trailer 4675 (the old central cafeteria). Donors are encouraged to schedule an appointment in advance at <http://llesa.llnl.gov/>, and clicking on the words "Blood Drive," located to the left side of the window. Instructions for navigating the Red Cross Website are listed here. Individuals without Internet access can schedule an appointment by calling the LLESA Office, 2-9402. Donor eligibility questions should be directed to the American Red Cross at 1-800-448-3543.

Wednesday
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A **Fidelity retirement counselor** will be available today and April 14 and 27 to assist with: assessing the current state of retirement accounts, learning how to plan asset allocation and diversify investments within retirement accounts, as well as identifying income strategies when planning retirement. Fidelity Mutual Funds are available to UC's workplace retirement plan participants in addition to the UC-managed investment pools. If you would like to set up a one-on-one consultation, call 800-642-7131. When calling be sure to specify that you are an LLNL employee.

Thursday
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Attention LLNL and Sandia postdocs: Would you like to join fellow postdocs for stimulating conversation and fun extracurricular activities? If so, join the **LLNL Post-Doc Networking Group** today for a coffee break and planning meeting at 3 p.m. in Bldg. 219, room 163. In addition to meeting fellow postdocs over beverages and goodies, you will be introduced to the Post-doc Bulletin Board and have an opportunity to brainstorm on activities for the next year. In particular, the group will start planning a May or June picnic. Check out the Postdoc Bulletin Board at <http://step.llnl.gov/postdoc/> or contact Colleen Elso, elso1@llnl.gov, or Hans Aichlmayr, htaichl@sandia.gov.

RETIREES' CORNER

Bess Minger (e-mail: bminger@citlink.net), who was an employee of the Lab and AEC, now lives in Elk Grove. She receives *Newsline* and tries to keep up with current activities. She is a friend of Olga G. Jones who had been a Lab employee for many years and knows many current and retired employees. Bess received a phone call from Olga's granddaughter informing her that Olga's husband of more than 50 years, A.W. Jones, recently passed away. Olga's friends may wish to send their condolences to her in Sun City West, Ariz. Her e-mail address is: ogjones@aol.com.

Retirees **Kristian Daland**, **Robert Baltzer**, **Henry Chau**, **Jane Olson** and **Hiram Van Blarigan** are members of the Tri-Valley Chapter of the Self Help for Hard of Hearing (SHHH) local chapter of the National organization. They invite all hard of hearing people needing help to join them. Jane can provide information on the group.

Jane (Mechanical Engineering, 1993) and **Gus** (Electronics Engineering, 1993) **Olson** had a busy February. They spent five days in LaQuinta, Calif. (near Palm Springs) with **Garith** (Engineering, 2002) and **Amy** (Laboratory Services, 2002) **Helm** in their new lovely home in a resort-like gated community. They attended a concert, went to the Follies, ate out at great restaurants and generally had a great time engaging in long, relaxed, philosophical discussions. Two weeks later they went to Reno on the Snow Train for three days. They attended a Broadway Show and the Spirit of the Dance and made their contributions to the casinos. The return train trip was an absolutely beau-

tiful winter wonderland. They highly recommend this trip although reservations have to be made months in advance because the train only makes eight trips.

Because the Livermore Library is moving to its new facility, the LLNL Retirees Travel Slide Group has changed locations for March through June. The 2 p.m. April 27 meeting is in the Livermore Police Department Community Room (next to City Hall). This month's show is on Spain and Portugal presented by **Jim and Bobbie Hadley**. The travel groups meets on the fourth Tuesday at 2 p.m. January through June.

The next retiree luncheon will be Wednesday, April 21 at Cattleman's restaurant. The speaker will be Phil Arzino, the Health Services Department's health promotion manager. His talk is titled "Losing Weight – Making Sense of the Low Carb vs. Low Fat Controversy." He will discuss the good and bad health effects of the various diets. David Leary, LLNL head of Security, also will be there to discuss the new retiree badge procedures. To make reservations, go to the Retiree Organization Web page: www.llnlretirees.org. While there, check out Alan Mode's notes from the recent Council of University of California Retiree Associations (CUCRA) meeting. He will have additional comments from the meeting at the April luncheon.

Please send any news or input to Jane or Gus Olson. E-Mail: AugustO@aol.com or JaneRupert@aol.com, phone: 443-4349, or snail mail address, 493 Joyce Street, Livermore, CA 94550.

IN MEMORIAM

Francis R. Leandro

Frank Leandro, a retired Laboratory machinist, died March 27 at his home in Livermore. He was 82.

Leandro was born to Francis J. and Jane Leandro in Haiku, Maui, on Aug. 31, 1921. He graduated from St. Louis High School in Honolulu in 1939. He served in the U.S. Army from 1942-45; was a pilot for Hawaiian Airlines, then moved to California in 1958. He worked at the Lab until 1984.

Leandro enjoyed golfing, ballroom dancing and painting. He was a parishioner at St. Michael's Catholic Church and volunteered many hours at the St. Vincent De Paul Food Bank. He was a member of the VFW, the Livermore-Pleasanton Elks and SIRS, 155. In recent years, he enjoyed weekends watching grandchildren compete in soccer and swimming.

He is survived by his children, Alethea Leandro-Farr of Salinas, Paul Leandro of Fremont, Merri-Jane Viglizzo of Salinas, John Leandro of Fremont and five grandchildren, Ryan, Jamie, Jessica, Taylor and Brooks, and his dance partner and close friend Mary Kroesen.

Visitation will be from 5 to 7 p.m. on Monday, April 5, and from 8:30 to 10 a.m. on Wednesday, April 7, at the Wilson Family Funeral Chapel, 3070 East Ave., Livermore. A rosary will be said at 7 p.m. on Monday at the Chapel followed by a VFW service. A funeral mass will be celebrated Tuesday, April 6, at 10:30 a.m. at Saint Michael's Church, 458 Maple St. Burial will be in Kaneohe, Oahu.

Robert J. Woodworth

Robert J. Woodworth, a longtime Livermore resident, died March 13 in Davis, Calif. He was 81.

Woodworth was born in 1923 in Alamosa, Colo. He served in the U.S. Army Air Corp during World War II in the Pacific Theatre. He married Mary Colleen Price in 1958. He relocated to Livermore and worked at the Laboratory as a mechanical engineer for 30 years.

Woodworth was a member of the Shriners, the Scottish Rite Temple in Oakland, and was a Mason with Lodge #218 in Livermore. He also belonged to SIRS #101 in Livermore. He enjoyed model railroading, fly fishing and gardening.

Woodworth is survived by his children, Connie Baumgardner of Kansas, Charlotte Ryel of Colorado, Donald Woodworth of Colo., Cheryln Sole of Oakley and Robert E. Woodworth of Sunnyvale; eight grandchildren and four great-grandchildren.

Newsline

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Scientist creates supercomputer by linking laptops

By Bob Hirschfeld

NEWSLINE STAFF WRITER

How would you like to help build a supercomputer?

It's easy. No special skills are required, and all you need is a moderately fast laptop running Windows or x86 Linux.

Bring it with you Saturday (April 3) to the University of San Francisco (USF) and join other enthusiasts to network everyone's computers together and create a temporary supercomputer.

The event is the brainchild of Pat Miller, who works at LLNL's Center for Applied Scientific Computing, and teaches a graduate computer science seminar at USF called "Do It Yourself Supercomputing." But instead of working with 16 students in a classroom, Miller expects to see a "flashmob" on Saturday, consisting of perhaps 1,000 people, crowded into USF's Koret Gymnasium.

Participants need to pre-register at <http://www.flashmobcomputing.org/> and bring with them a 1.3 gigahertz Pentium III Celeron/AMD equivalent or better, with at least 256MB of RAM.

Miller explained that the day's highlight will occur when organizers run the LINPACK benchmark, a software program that measures the speed of supercomputers. He hopes the ad hoc computer system will achieve a ranking that puts it on the official "Top 500" list of the world's fastest supercomputers.

Unfortunately for people with Macintosh computers, the utility code Miller and his students compiled is written specifically for x86 type processors. Even though there will be many different physical kinds of laptops and desktops, the software boots them up to look as identical as possible.

"We excluded Macintosh here," explained Miller, "because it would take too much time for us at this point to build and test the software to keep this beautiful homogeneity."

Everyone will receive a commemorative T-shirt as well as a special CD-ROM, containing all the software necessary to network the laptops together. The network will access only the CD-ROM. No software is written to



JACQUELINE MCBRIDE/NEWSLINE

Pat Miller of the Laboratory's Center for Applied Scientific Computing holds CDs with software for Saturday's "Do It Yourself" supercomputer event.

or from the volunteers' hard drives.

Even if the Flashmob computer achieves its goal and attains a ranking on the Top 500 list, Miller said it's important to delineate the difference between a temporary multi-processor machine, and full-time supercomputers.

One major difference is the speed with which data can be sent from one computer node to another. An ad hoc network is extremely slow, whereas the traditional systems are optimized to have high bandwidth and very low latency.

Nevertheless, Miller said the Flashmob computer is an improvement over well-established distributed networks such as the SETI@Home project.

"Think of SETI as a bunch of people working at rows of desks like '50s film noir," he said. "They work on a piece of paper for a while, give it to a mail clerk who takes it off to parts unknown and delivers a new piece of paper to work on. That system performs well if you work

on a task for a couple of hours and then ask for a new message, work for a few hours and ask for a new message, because the ratio of communication to computation costs is in your favor.

"In one of the big iron machines, it's like every clerk has 1,024 phones connected to every other clerk in the building. And when they pick up the phone, the other person answers instantly. The problem is, you essentially need to buy 1 million telephones. It's much more expensive, but nobody has to wait and everyone stays more efficient.

"The FlashMob falls in between. Since we can't afford 1 million telephones, we accept that messages will go slower. It's more like when accountant #37 has to talk to accountant #873. The first one shouts out to get the other one's attention and then they start up a tin can and string telephone (well, maybe a telegraph line) between them. This is a lot better than the SETI mailroom where things disappear for hours and then reappear, but it is also a lot slower than having 1 million shiny telephones at your disposal."

The other major difference is that the Flashmob system will not use the participants' hard drives.

"We're not reading much in," explained Miller, "and we're not writing much out. The big machines have really high performance input/output (I/O) that lets you stream terabytes on and off the machines in a reasonable amount

of time. If you look at the costs of the machines (hardware) we buy — a lot of the cost is the switch. And a lot of the cost of the software is in the specialized I/O."

Last week, Miller built a prototype Flashmob system with 32 basic desktops in a USF computer lab, and achieved a LINPACK rating of 42 gigaflops (billions of floating point operations per second), all at a total cost of \$16 for blank CDs.

"And it only took 10 minutes to reboot everybody back to a standard Windows 2000 machine ready to run Excel all day," Miller said. "Nobody has anything like that — that's why we want to do this. There are people who want to do science who can't get these kinds of cycle counts for love or money. This lets them get a baby cluster that one can cut one's teeth on."

On Saturday, Miller and his volunteers expect that the 1,000 computers will run the LINPACK linear algebraic function in approximately four hours.

BRIEFLY

Summer swimming programs to end

Citing decreasing participation, the Lab's Employee Services Association (LLESA) will discontinue its summer pool program for Laboratory employee families, beginning with the 2004 season. Midday lap swimming, aqua aerobics and networking group use of the pool will continue for Lab and Sandia employees.

LLESA began considering closure of the summer swim program last year. A decrease in the number of employees who live in Livermore has steadily reduced participation in LLESA's summer aquatics program. While this was a difficult decision for LLESA, the opening of the new pools, park and community center at Robert Livermore Park provide convenient new options for the lost services.

Last week, LLESA sent letters to the Children's Center as well as swim program participants from last year, informing them of the decision to close the summer aquatics programs. The Children's Center is working with the Robert Livermore Community Center to provide lessons through the new community pools. A list of alternative pool program resources can be found on the LLESA home page at <http://llesa.llnl.gov>.

For more information on use of the Lab pool, call the LLESA Office, 2-9402, or Cynthia Rose, LLESA work/life manager, 3-7659.

Registration closes today for sensors workshop

Registration closes today for the Laboratory's second annual sensors workshop, which will be held on site next week. Sponsored by the Lab's Engineering Directorate, the workshop will run from 8:30 a.m. to 4:30 p.m. on April 6 and 7 in the Bldg. 132S auditorium.

A broad range of sensor topics will be covered during the two-day event, including the use of sensors for weapons inspections, detecting biological or chemical pathogens for counter terrorism, radiation detection, hyperspectral remote sensing and extreme ultraviolet detectors used in the production of computer chips.

Registration can be made at this Website: <http://engineering.llnl.gov/sensorsworkshop/>. Registration ends today at 5 p.m.

Presentations will be made next week by researchers from the Laboratory, Los Alamos National Laboratory, Sandia National Laboratories in Albuquerque and Livermore, and Kansas City Plant.

The workshop is open to employees with Q-clearances with sigmas 1-10.

Health Services offers health forums

The Health Services Department and the Worklife Programs Office are sponsoring a trio of health promotion discussion forums that will focus on various health topics. Enrollment is limited to 20 participants to promote an open discussion and foster greater understanding of the health topic. Participants must pre-register. The forums will include time for questions and educational

handouts. Forums are scheduled for April, June and July. The first forum will be:

Eating Disorders in Women (Anorexia and bulimia), Thursday, April 8, noon to 1 p.m., Bldg. 571, room 2301. Eating disorders are common and potentially serious illnesses. Common behaviors include restrictions of food intake or bingeing/purging combined with excessive concern with body, weight or shape. This disorder can affect your children away at college, co-workers, siblings, spouse, parents or grandparents.

The June topic is Gastro esophageal Reflux Disease (GERD) and the July topic is Interstitial Cystitis.

Unabomber brother to speak at Lab

David Kaczynski had suspicions early on that his brother Ted may have been the Unabomber. The FBI confirmed those suspicions after its investigation and the subsequent trial resulted in Ted Kaczynski's conviction. Over nearly a 17-year period Ted Kaczynski carried out 17 bombings that killed three people and injured 23. Because his targets were mainly airlines and academics, he became known as the Unabomber — for UNiversity and Airline bomber.

On Tuesday, April 13, at 10 a.m. in the Bldg. 123 auditorium, David Kaczynski will talk about "Doing the Right Thing — When It's the Hardest Thing To Do," about his experiences before, during, and in the years following his decision to act on his instincts.



NEWS YOU CAN USE

Policy updated for classified removable electronic media

University of California President Robert Dynes has initiated a series of security policy documents with the intention that there is a consistent and uniform approach for managing specific security processes by:

- Establishing common practices to comply with specific DOE/NNSA requirements and
- Adopting the best practices that have been identified by the Lawrence Livermore National Laboratory (LLNL) and the Los Alamos National Laboratory (LANL).

The first of the policy documents has been issued concerning accountable Classified Removable Electronic Media (CREM). In collaboration with LANL, a uniform policy will strengthen LLNL's accountability for CREM

and help prevent problems that the laboratories have experienced in the past. The Laboratory must work diligently to reduce CREM holdings, and rely on a strong system of engineered controls or other innovative approaches until the Lab is able to establish a media-less environment in every workplace possible.

Changes required at LLNL are minimal and appear to be cost effective. More importantly they will provide employees with additional tools to aid them with their responsibilities. The Laboratory has begun implementation of the changes and expects significant progress by the end of April given the continued attention of senior management. Maylene Wagner, Classified Matter Protection and Control (CMPC)

manager, has been working with the DSSOs and concerned parties to achieve a successful implementation. She expressed her thoughts on the project, saying, "Initiating any new policy can be difficult, but the benefit of working with another facility that faces the same operational and security challenges has brought the best practices to us both. I believe this partnership will serve us well."

The UC Policy document, as well as a summary of the changes is posted on the CDPO Website: <http://cdpo.llnl.gov>. The documents have been circulated and vetted through the directorates. It is critical that all employees and managers help to meet these commitments. If you need additional information, contact Maylene Wagner, 2-4774.

Technical Meeting Calendar

Friday
2

ICF/HEDES

"Transmission Electron Microscopy (TEM) — What Can It Do? What Does It Take?," by interviewee Joerg

Jinschek, LBNL. 10:30 a.m., Bldg. 219, conference room 238. Contact: Bruce Remington, 3-2712, or Anika Rodda, 2-6377.

H DIVISION SEMINAR

"Calculation of Excitons from Time-Dependent Density Functional Theory," by Oleg Pankratov, Universität Erlangen-Nürnberg, Germany. 3:30 p.m., Trailer 2128, room 1000. Contact: John Klepeis, 2-6103, or Darlene Klein, 4-2868.

INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"The Massive Black Hole in the Galactic Center," by Eliot Quataert, UC Berkeley. Noon, Bldg. 319, room 205. Contact: Wil van Breugel, 2-7195, or Sharon Taberna, 3-6290.

H DIVISION SEMINAR

"Hierarchical Multiscale Study of Pt Nanoparticles," by Byeongchan Lee, Stanford University. 10:30 a.m., Bldg. 219, room 163 (controlled area). Contact: Robert Rudd, 2-4292, or Darlene Klein, 4-2868.

Monday
5

BIOSECURITY & NANOSCIENCES LABORATORY SEMINAR

"From Attoliters to Liters to Yottaliters: Applications of

Magnetic Resonance to Chemical, Enological, and Geological Problems," by Matthew Augustine, UC Davis. 2 p.m., Bldg. 151, room 1209 Stevenson Room (P-cleared). Contact: Sarah Chinn, 2-5514, or Katie Thomas, 2-7903.

Tuesday
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PHYSICS & ADVANCED TECHNOLOGIES DIRECTORATE-WIDE POSTDOC FORUM

"Finite-Element Method for Large-Scale Ab Initio Electronic-Structure Calculations," by John Pask. 1:30 p.m., Trailer 2128, room 1000 (CUF). Contact: Andrew J. Williamson, 2-8285.

PHYSICS & ADVANCED TECHNOLOGIES DIRECTORATE-WIDE SEMINAR

"BRIGHT Lights, BIG City: Massive Galaxies, Super-Massive Black Holes and Proto-Clusters," by Wil van Breugel. 2 p.m., Trailer 2128, room 1000 (CUF). Contact: Alan J. Wootton, 2-6533

ELECTRONICS ENGINEERING /MICROSENSORS WORKSHOP 2004

Exchanging ideas, describing performance, articulating needs, and creating cooperative exploration for sensors employed within the Department of Energy weapons community. Tuesday and Wednesday, April 6-7, 8:30 a.m. – 4:30 p.m., Bldg. 132, room 1000, Q-clearance required. Contact: Tony Laviertes, 3-6766, or Lei Loni Rodrigues, 2-0654.

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"A Study of High Order Finite Difference Schemes for Compressible Fluid Dynamics and the Equations of MHD," by Bjorn Sjogreen, LLNL, CASC. 10 a.m., Bldg. 451, room 1025 (property protection area). For more information, go to <http://www.llnl.gov/casc/calendar.shtml>. Contact: Leslie Bills, 3-8927.

CHEMISTRY & MATERIALS SCIENCE DIRECTORATE SEMINAR

"Applied Peptide Synthesis — From Simple Peptides to Proteins to Arrays and Biosensors," by Paul Hoeplich Jr., Gentura Consulting Group, Solana Beach. 10:30 a.m., Bldg. 155 auditorium. Foreign nationals may attend if approved security plan is on file which includes Bldg. 155. Contact: Dave Eaglesham, 2-0486, eaglesham2@llnl.gov, Julie Sedillo, 3-3506, sedillo3@llnl.gov.

CHEMISTRY & MATERIALS SCIENCE MATERIALS SCIENCE AND TECHNOLOGY DIVISION

"Ultrashort Pulse Studies of the Transition State Process in Myoglobin," by applicant Michael Armstrong. 9:30 a.m., Bldg. 155 auditorium. Contact: Wayne King, 3-6547, or Rebecca Browning, 2-5500.

Wednesday
7

UC DAVIS, DEPARTMENT OF APPLIED SCIENCE

"Predicting Dark Energy and Ramifications," by B. G. Sidharth,

International Institute of Applicable Mathematics and Information Science, India. 3 p.m., Bldg. 661 (Hertz Hall), room 7 (open area). Contact: Estelle Miller, 2-9787.

Thursday
8

BIOSECURITY & NANOSCIENCE LABORATORY/CHEMICAL BIOLOGY & NUCLEAR SCIENCE

"A Universal Approach to Biological Organism Identification," by R. Paul Schaudies and Doreen A. Robinson, Science Applications International Corporation. 10 a.m., Bldg. 151, room 1209 Stevenson Room. Contact: Jim De Yoreo, 3-4240, or Katie Thomas, 2-7903.

PHYSICS & ADVANCED TECHNOLOGIES/V-DIVISION SEMINAR

"Effects of the Electron Energy Distribution Function on Line and Continuum Emission," by Stephanie Hansen, LLNL 10:30 a.m., Bldg. 219, room 163. Contact: Stefanie B. Landes, 2-3201.

Friday
9

CHEMISTRY & MATERIALS SCIENCE, FRONTIERS IN CHEMISTRY AND MATERIALS SCIENCE

"Mechanical Behavior of Nanocrystalline Metals," by Julia Weertman, professor emerita, Northwestern University, Materials Science and Engineering. 3:30 p.m., Bldg. 235, Gold Room (1090). For information on Weertman and an abstract of her talk, see Website: http://www-cms.llnl.gov/cms_frontiers_ext/index.html. Contact: Mike Fluss, 3-6665, fluss1@llnl.gov, or Kristine Ramirez, 3-4681, ramirez24@llnl.gov.

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The deadline for the next Technical Meeting Calendar is noon, Wednesday.

Send your input to tmc-submit@llnl.gov. For information on electronic mail or the Technical Meeting Calendar list, see the auto registration service on the Web.

Science fair projects show home ingenuity



PHOTOS BY JACQUELINE MCBRIDE/NEWSLINE

Left, St. Raymond School student Meg Haupt discusses her project with fair judge John Moody. Haupt received first place, junior division, physical sciences and two special awards for Discovery Young Scientists from Zone 7 Water Agency. At right, Harvest Park Middle School student Alexander Manaa talks about his project with judge Chelle Clements. Manaa received first place, junior division, behavioral sciences and the U.S. Navy special award.

By Linda Lucchetti

NEWSLINE STAFF WRITER

“Mother ‘Nose’ Best,” “Caffeine Blues,” and “Help me I’m Melting”— movie titles from the Sundance Film Festival? No, just a sampling of the 264 projects displayed at the 8th Annual Tri-Valley Science & Engineering Fair (TVSEF) that wrapped up last week at the San Ramon Conference Center in San Ramon.

Christine Mixan, TVSEF co-director, was pleased with the success of this year’s event.

“The main goal of the science fair is to motivate students in pursuing their interest in science and engineering and to support teachers in encouraging the students,” she said. “To see Tri-Valley students take such an interest and have such pride in their science projects was very rewarding for all of us who organized the fair.”

“High anxiety” best described the final hours of the competition, when more than 300 science-minded students in grades 7-12, from Livermore, Pleasanton, Dublin, Sunol, San Ramon and Danville, assembled to explain their projects to assigned judges.

About 150 local science professionals, more than one-half representing LLNL, served as judges, evaluating the entries based on the students’ creativity, scientific thought, thoroughness, skill and clarity of presentation.

This was Vic Castillo’s third year as a science fair judge. Castillo is a Ph.D. working for the Lab’s Computations Directorate in support of Defense Technologies Engineering Division (DTED) programs.

“The Science and Engineering Fair is a great opportunity for kids to get hands-on experience using the scientific method to explore the world around them,” he said. “It gives them a chance to exercise logic and creativity and sharpen their presentation skills in a competitive but fun environment. As a judge, I value the opportunity to meet and interact with such bright and enthusiastic students.”

First-time TVSEF judge Sabre Coleman, an environmental engineer in the Lab’s Environmental Restoration Division, feels that participating is a great way for Lab employees to “give back to the community.”

“As a judge, I enjoyed providing encouragement and suggestions,” she said. “The students saw that ‘real’ scientists and engineers, many who are from the Lab, were seriously interested in their projects. The students’ participation in the science fair along with the encouragement from their families, teachers, mentors, and judges may all contribute to them considering scientific careers. I enjoyed being a small part of that process.”

At the awards ceremony, Associate Director Steve Patterson of Engineering was on hand to extend congratulations to participants and winners. San Ramon Valley Unified School District students swept

the top honors capturing sweepstakes wins in both the senior and junior divisions.

Senior division winners in the team category were 12th-graders Lenny Pekelis and Jonathan Vinea of Monte Vista High School, whose winning project was titled, “Bacterial Electroporation.” San Ramon Valley High School ninth-grader Samuel Finlayson, won with his project called “Effect of Chlorine on Lung Function of Outdoor Swimmers.”

As part of their sweepstakes prizes, the senior division winners will go on to compete at the Intel International Science and Engineering Fair in Portland, Ore. in May. In addition, the winners will be offered summer employment at either the Laboratory or one of the Tri-Valley’s technical organizations.

Junior division winners were Diablo Vista Middle School seventh-grader Rohan Chakicherla, whose project was titled, “The Environmental Impact of Manipulation of Traffic Controller Algorithm”



Harvest Park Middle School eighth-grader Emma Bryant, age 9, discusses her project with judge Don Jedlovec. Bryant received third place, junior division, physical sciences.



PHOTO BY HIROHISA ODA

Above, Engineering Associate Director Steve Patterson gave the keynote address at the fair and handed out awards.

At right, Our Savior Lutheran student Jonathan Houghton received honorable mention, junior division, biological sciences.





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ITEMS OF INTEREST



Naval postgrad school signs agreement with Lab

By David Schwoegler

NEWSLINE STAFF WRITER

According to a memorandum of understanding between the Laboratory and the Naval Postgraduate School in Monterey, Calif., the nature of threats facing the United States has changed significantly. Current and future threats will be more diverse, more unpredictable and likely asymmetrical. Increased cooperation between government agencies is necessary to increase the flexibility and U.S. responsiveness in addressing these new threats.

"The Laboratory truly came of age in 1957, when the U.S. Navy decided to entrust design and development of its new Polaris missile warheads to Livermore," Laboratory Director Michael Anastasio explained. "The high yield and low weight of this warhead design were keys to deployment of an effective submarine-based system, enabling the Navy's role in our nation's strategic deterrent 'triad': land-based missiles, submarine-launched missiles, and strategic long-range aircraft. The highly integrated

warhead and reentry vehicle required close cooperation between the Laboratory and the Navy, establishing a new way of doing business for both.

"The historical relationship between the Laboratory and the U.S. Navy reaches back even farther, to the Lab's founding. The land where the Lab is sited was Naval Air Station Livermore, part of the Naval Air Primary Training Command," Anastasio said.

Signed by Anastasio and Rear Adm. Patrick W. Dunne — and in effect for five years — this MOU establishes a collaborative framework to advance the academic and scientific capabilities of the two institutions in service to national security. NPS students can work with researchers at Livermore on cooperative projects six to eight weeks per year.

"Now that we have formalized our relationship, NPS students will have an excellent opportunity to work with Livermore scientists on real-world projects that directly enhance our national security and foster increased collaboration between our organizations," Dunne said.

Livermore benefits from the program

through the strong educational, military research and operational expertise at the Naval Postgraduate School. NPS benefits because the Lab provides the strength of a premier applied-science institution with core capabilities in nuclear weapons stewardship, non-proliferation, advanced defense and homeland security technologies, plus a wide array of scientific and engineering expertise.

Another important facet of this cooperative arrangement is formalization by the MOU of an existing Livermore visiting-faculty position at NPS. Craig F. Smith, a Ph.D. engineer from the Energy and Environment Directorate's Energy Technology Division, was selected to fill the Lawrence Livermore chair professor position.

The partnership leverages the respective resources within tightly constrained national budgets. The Lab's National Security Office will coordinate oversight for the program at Livermore.

COLLABORATION

Continued from page 1

very good collaboration, provide learning opportunities for our students, and attract more people at UCLA to think about NIF.

"When these joint professorships were first proposed two or three years ago, it was clear that doing something with LLNL around NIF was an ideal thing to do; it was a very win-win kind of situation," he said.

The new joint professorship is one of a number of initiatives designed to encourage scientific collaborations between the University's campuses and labs for both students and faculty members. UC is accepting pre-proposals until April 30 for the next round of two of those programs: the Campus-Laboratory Exchange (CLE) and Campus-Laboratory Collaborations (CLC) programs, both funded by a portion of the compensation UC receives from the U.S. Department of Energy for managing Livermore and Los Alamos national labs. The CLE program pays for one-year scientific collaborations involving faculty, laboratory staff, students and postdocs at UC campuses and one or both of the laboratories. The CLC program funds three-year collaborations, providing seed money for long-term collaborative research projects.

One of the most successful CLC projects has been a pilot study in genomic analysis begun by UCLA and LLNL in 2001 with a \$1.2 million UC investment. The project grew into a 24-laboratory consortium, funded by a five-year, \$28-million grant from the National Institutes of Health, to analyze the structures of more than 400 important proteins in the tuberculosis bacterium.

In another UCLA-LLNL collaboration, Shimon Weiss, a professor in UCLA's chemistry and biochemistry department, is joining forces with Livermore researchers to develop new techniques for studying how proteins fold into the unique shapes that determine their function in the body. Another project aims at developing new ultra-high-speed detectors that will be able to discern the interactions of individual molecules.

UC faculty to discuss Lab contract

Members of the University of California Academic Senate will participate in a series of "town hall" meetings this month to discuss the University's future role in managing Livermore and Los Alamos national laboratories.

The meetings, which begin at UCLA next Tuesday, will set the stage for a statewide electronic survey of UC faculty members May 3-14. The survey will gather faculty members' opinions on whether UC should submit bids to continue managing the labs after their current contracts expire in November 2005. The US Department of Energy announced in January that the LLNL, Los Alamos, and Lawrence Berkeley lab contracts, which have been held by UC since the labs were founded more than 50 years ago, would be competed for the first time.

Other "town hall" meetings currently scheduled are:
 April 20 – UC Santa Barbara
 April 21 – UC Berkeley
 April 22 – UC Davis
 April 27 – UC San Diego

Background information and status reports on the contract competition from both UC and the Laboratory can be accessed from the Lab's internal portal front page or by going to <http://www-r.llnl.gov/contract/>.

"There are some things you just cannot do on the campus," Weiss said. "You need the kind of large infrastructure that's available at the labs. You need the equipment, and you need the know-how.

"I'm looking forward to expanding my relationship with (Livermore)," he added. "I really look at this as a strategic alliance, and I'm enjoying it tremendously."

The most important element in establishing a collaboration, Peccei said, is to "find areas where there is a clear connection, and then expand from there. For example, although we have not yet proposed a joint professorship, there are many common areas in computational science and engineering at LLNL and UCLA, and we're trying to find ways to work together. We're beginning to craft possible collaborative programs in such areas as biophysics, data mining and environmental science."

The joint UCLA/NIF Professorship in High Energy Density Science is modeled after existing

joint appointments between the Los Alamos Neutron Science Center (LANSCE) and UC San Diego, and between Lawrence Berkeley National Laboratory's Advanced Light Source (ALS) and UC Davis and UC San Francisco.

"The UCLA/NIF professorship is a very good jumping ground to initiate a whole series of new collaborations between the campuses and the labs," Peccei said. "The LANSCE and ALS professorships have been quite successful, and I'm sure the new ones will be equally successful."

NIF, now under construction, will focus 192 high-energy laser beams on a target the size of a pea, momentarily creating the immense pressures and temperatures found in stars and supernovae. NIF will enable physicists to better understand the physics of nuclear explosions without underground testing, and to demonstrate the feasibility of producing clean, inexhaustible energy from inertial confinement fusion. NIF experiments will bring the study of astrophysical phenomena, materials science, and nuclear physics into a controlled laboratory setting.

Along with benefiting UCLA faculty and students by giving them direct access to NIF, Peccei said, the joint professorship will also be a boon to NIF, creating a pool of potential employees from participating students and postdocs who have had a head start on

"climbing the very steep learning curve" involved in working at such a complex facility. Other benefits to the laboratory include enhanced professional development of Lab scientists and engineers through seminars and other contacts with the Laboratory professor, enhanced research activities and the development of new technologies, and better access to the expertise available at UC campuses.

"I'm very excited by the development of this new partnership between the University of California, UCLA and the National Ignition Facility," said George Miller, LLNL's associate director for NIF programs. "It recognizes the exciting, cutting edge scientific research that is enabled by NIF and will help cement a long-term relationship between NIF and the academic research community that will be essential for our success."

Note: Links to Requests for Proposals (RFPs) for the CLC and CLE programs can be found at <http://labs.ucop.edu/internet/research/index.html> and are due April 30.



THE BACK PAGE

PU

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in cans that would be safe for long-term storage up to 50 years.

"This project required cooperative effort between the Lab, DOE/LSO and Savannah River," said Joe Sefcik, leader of the Nuclear Materials Technology Program. "The next important step will be to transport the canned material off site for disposal or conversion to mixed-oxide fuel."

Meeting the milestone required two significant accomplishments. First water-soluble volatiles were removed from the impure oxides using an oxide washer acquired from the Russian Institute of Atomic Reactors.

The second effort was stabilizing and packaging the surplus material to meet the DOE-STD-3013 and the Savannah River Site acceptance criteria. Stabilization required calcination, heating the plutonium oxide to a high temperature to drive out moisture and any other volatile impurities.

Finally, the Livermore inventory was packaged to



DAVID SCHWOEGLER/NEWSLINE

Left to right, Defense Nuclear Facilities Board member John Mansfield, David Beck, assistant NNSA deputy administrator for Military Applications & Stockpile, and DNFSB staff assistant James McConnell view a DOE-STD-3013 can held by NMTP plutonium scientist Daniel Mew. The cans are used to store and transport plutonium oxide.

meet the DOE-STD-3013 Plutonium Packaging and Storage Standard. An inner convenience can was filled

converted into mixed oxide fuel for nuclear reactors.

with stabilized Pu-oxide. The convenience can was then welded into an inner DOE-STD-3013 can. These two cans were then welded into a third outer DOE-STD-3013 can. Each can was then radiographed to establish a baseline for future surveillance efforts.

"This achievement was a true team effort," said Karen Dodson, the pyrochemist in the Superblock who led the Lab effort. "We've completed a very difficult job with very demanding standards. We have a laundry list of people in the plutonium facility to thank for this accomplishment."

The canned plutonium will be shipped to DOE's Savannah River Site in South Carolina for storage. Eventually, the plutonium will be removed from the cans and either immobilized for safe underground disposal, or

CHROMOSOME

Continued from page 1

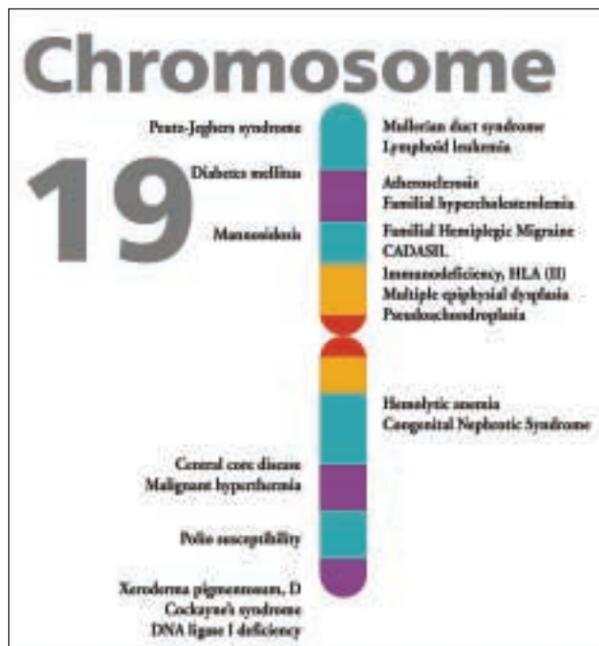
and other environmental pollutants. Studies of DNA-repair genes, initiated at the DOE national laboratories, are yielding insights into the development of certain cancers, many of which appear to be caused by defects in DNA-repair pathways. Also, new insights are being gleaned about other gene families implicated in detoxifying and excreting chemicals foreign to the body.

"With this high quality sequence now made freely available to the scientific community, more light will be shed on individual responses to medicines," Abraham said. "This will enable the development of more sensitive diagnostics for susceptibility to a wide array of important diseases. In time, with this information in hand, physicians will be able to tailor more effective individualized therapeutic strategies."

Chromosome 19, at 55.8 million bases or letters of genetic code, although representing only about 2 percent of the human genome, features nearly 1,500 genes. They include genes that code for such diseases as insulin-dependent diabetes, myotonic dystrophy, migraines and familial hypercholesterolemia (high levels of cholesterol in the blood) that increases the risk of cardiovascular disease.

"Beyond the significant revelation that Chromosome 19 has more than twice the gene density of the genome-wide average, it also offers a fertile landscape for exploring evolutionary motifs," JGI Director Eddy Rubin said. "An intriguing picture has emerged regarding conservation and divergence, revealing large blocks of gene conservation with rodents as well as segments of coding and non-coding conservation with more distant species such as the puffer fish, *Fugu rubripes*, which also was sequenced here at the JGI. While not long ago these non-coding regions were considered nonsense, now they are actually proving to have powerful regulatory influence over the genes that they bracket."

The DOE originally selected Chromosome



19 as a sequencing target because of the agency's abiding mission of investigating the link between DNA damage from radiation exposure and human cancer. Initial work conducted by the Laboratory in the mid 1990s led to the mapping of multiple DNA repair genes on Chromosome 19. In 1999, the sequencing and finishing project was transferred to the JGI and the Stanford Human Genome Center, respectively.

"Unlike earlier draft human genome sequences, this version is 500 times better in terms of contiguity and accuracy — which makes a huge difference if you are trying to do biology with that sequence," said Richard Myers, director of the Stanford Human Genome Center. "It gives you a sense of the chromosome's topography — one filled with such biologically interesting features as transcription factors, olfactory receptor genes, and zinc finger genes."

Olfactory receptors represent the largest multigene family in higher organisms, which have evolved in response to the need for animals to recognize millions of odors — both threatening and attractive — in its environment. Transcription factors are proteins that need to

be recognized by RNA polymerase in order to initiate the elaboration of nucleotides along the DNA molecule. Zinc finger proteins are chains of amino acids that capture a zinc ion and bind to RNA or DNA and play a critical role in a cell's life cycle. These proteins regulate the expression of genes as well as nucleic acid recognition, reverse transcription and virus assembly. Drug development efforts seek to disrupt these zinc finger structures to prevent viruses from functioning.

For the complete story and background information, check the Web at: <http://www.llnl.gov/llnl/06news/NewsReleases/2004/NR-04-03-08.html>



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